REMARKS

Initially, in the Office Action dated January 13, 2005, the Examiner rejects claims 1-12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,636,862 (Lundahl et al.) in view of U.S. Patent No. 5,850,339 (Giles). Claims 1-12 remain pending in the present application.

35 U.S.C. §103 Rejections

Claims 1-12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Lundahl et al. in view of Giles. Applicants have discussed the deficiencies of Lundahl et al. in Applicants' previously filed response and reassert all arguments submitted in that response. Applicants respectfully traverse these rejections and provide the following additional remarks.

Giles discloses a method for analyzing a data set and determining the independent input variables and the values of those variables which are most associated with a specific outcome. Independent and dependent variables may be either numeric (continuous) or categoric (discrete); numeric variables need not be of a specific distribution type. First, each individual independent variable is ranked based on a score. Scoring is done by first determining the number of records in the data set having each of four possible conditions--independent variable in or out of range in combination with dependent variable in or out of range. These values are put into an equation. Iterative processes are used until a high score is found. Subsequently, combinations of variables and values of independent variables are

evaluated using the score to determine the combinations most likely to be associated with a specific outcome or range of values of the dependent variable.

Regarding claims 1, 8 and 11, Applicants submit that none of the cited references, taken alone or in any proper combination, disclose, suggest or render obvious the limitations in the combination of each of these claims of, inter alia, preparing a plurality of prediction models arranged in a hierarchical tree structure in the computer; calculating, with the prediction model in a first root layer of the hierarchical tree structure, an output value from at least one attribute included in the input data by a calculation unit of the computer; selecting the prediction model in a subsequent layer of the hierarchical tree structure according to the output value by a selection unit of the computer; repetitiously executing the output value calculation step and the subsequent layer prediction model selection step while shifting the layer to a leaf side of the hierarchical tree structure until the prediction model of a final leaf layer of the hierarchical tree structure is reached; or calculating a score form the input data using the prediction model of the final leaf layer by the calculation unit.

The cited portions of Lundahl et al. do not disclose or suggest these limitations in the claims of the present invention. Lundahl et al. discloses the modeling and the prediction using the model (see, col. 8, lines 60-67; col. 9, lines 1-67; col. 10, lines 1-10; and col. 44, lines 9-44). The relation among data matrix X, data matrix Y and data matrix Z is modeled. At first, Y is divided into plural clusters by cluster analysis. Secondly, a model showing the relation between X and Y and a model showing the relation between Y and Z are made. Next, the optimal Z element

is predicted using such models. Lundahl et al. also shows to dynamically modify the model. Lundahl et al. also discloses to provide prediction models for respective clusters to determine whether the data belongs to the cluster or not. The data is input to respective prediction models to predict the cluster to which the data belong to according to the output values of the prediction models (see, col. 42, lines 37-60). The description on column 43, lines 10-15 shows to identify most accurate prediction model. Lundahl et al. determines a cluster to which an unknown data belongs using prediction values of prediction models of respective clusters (see, cols. 34 and 35 and Fig. 10). These portions of Lundahl et al. disclose: (1) predicting a cluster to which the input data belongs using a cluster prediction model; (2) calculating the prediction values using four prediction models; and (3) selecting a final prediction value using the reference indicators which show the prediction accuracies. This is not <u>selecting the prediction model in a subsequent layer of the hierarchical tree structure according to the output value by a selection unit of the computer</u>, as recited in the claims of the present application. Lundahl et al. discloses calculating the prediction values <u>using four prediction models</u>. In contrast, the limitations in the claims of the present invention <u>selects one of the prediction models</u>. Further, Lundahl et al. selects one of the <u>predication values</u>. This is not selecting <u>a prediction model</u>, as recited in the claims of the present invention. Lundahl et al. is different in selecting object and approach from the limitations in the claims of the present invention.

Moreover, Giles does not disclose or suggest the limitations in the claims of the present invention. The Examiner admits that Lundahl et al. does not disclose or suggest an hierarchical tree structure as recited in the claims of the present invention, but asserts that Giles discloses this limitation at col.2, lines 39-63. However, these portions of Giles merely disclose that many of the traditional cluster analysis methods, both partitioning and hierarchical, are encumbered by looking for many or all possible clusters within the data, followed by a cluster consolidation process, and that for data sets with more than a few variables some processes used to reduce the dimensionality (number of variables) of the data can make the results difficult to comprehend, that while nonmetric cluster analysis avoids some of these problems and is quite well suited for determining variables important in finding and describing groupings in data, it is computationally intensive for data sets containing large numbers of records as is usually true of manufacturing data sets, and that classification trees splits the data set into subsets such that the final output which contains the most important variables within specific ranges often contains a relatively small subset of the original data records. This is not preparing a plurality of <u>prediction models arranged in a hierarchical tree structure</u>; calculating, with the prediction model in a <u>first root layer of the hierarchical tree structure</u>, an output value from at least one attribute included in the input data; selecting the prediction model in <u>a subsequent layer of the hierarchical tree structure</u> according to the output value; <u>shifting the layer to a leaf side of the hierarchical tree structure</u> until the prediction model of a final leaf layer of the hierarchical tree structure is reached; or calculating

a score form the input data using the prediction model of the final leaf layer, as recited in the claims of the present application. Giles discloses a hierarchical clustering where hierarchical clustering is one of data mining approach for classifying unknown data set into some subsets or clusters. Hierarchical clustering is an agglomerative approach in which single expression profiles are joined to form groups, which are further joined until the process has been carried to completion, forming a single hierarchical tree. The clusters constitute the tree and the tree grows from branch to root. There is no input/output function on each node or branch of the tree structure in Giles. In contrast, the present invention arranges the prediction models in tree form and data goes from root to branch. The route is determined according to the function (prediction model) output. Giles in tree structure component and tree structure function. Giles describes the method for finding the optimal boundary for each independent input variables and calculating a score for each independent input variables (see, col. 4, lines 48 – col. 5, line 5). The score indicates the accuracy of the prediction model but not the prediction value (output of the prediction model). In contrast, according to the present invention, the score indicates the output of the prediction model.

Regarding claims 2-7, 9, 10 and 12, Applicants submit that these claims are dependent on one of independent claims 1, 8 and 11 and, therefore, are patentable at least for the same reasons noted previously regarding these independent claims. For example, Applicants submit that none of the cited references disclose or suggest where the prediction model is a scoring model to calculate a score from attributes of

the input data or an attribute prediction model to predict, from attributes of the input data, a value of another attribute, or where the prediction model in the final leaf layer is a scoring model, or where the selection of the prediction model in the subsequent layer is determined according to the output value and a stored threshold value by the selection unit.

In view of the foregoing remarks, Applicants submit that claims 1-12 are now in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger & Malur, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.39461X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.

Frederick D. Bailey
Registration No. 42,282

FDB/sdb
(703) 684-1120